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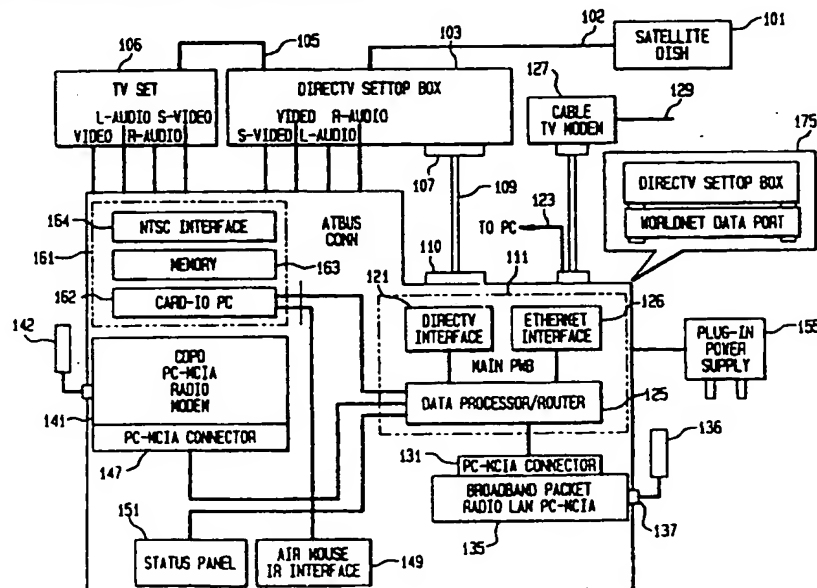
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## (54) Broadband data reception system for accessing a network

(57) Termination equipment for a WorldNet™ wireless network receives packet data from a data terminal of a DirecTV™ Settop Box. This data is directed to a recipient through a router and transmitted by wireless or coax LAN to customer premises data equipment. Replies to the network by customer premises equip-

ment are transmitted by wireless or coax LAN to the router to a CDPD radio modem for transmission, via CDPD, to a remote termination connected to the network.



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# EUROPEAN SEARCH REPORT

Application Number  
EP 97 30 6345

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	WO 95 28059 A (LINCOLN MINT HONG KONG LTD ;LNN INTELLECTUAL PROPERTIES CO (US)) 19 October 1995 (1995-10-19) * page 12, line 20 - line 32 * * page 14, line 7 - line 30 * * page 17, line 25 - line 34 * * page 20, line 8 - page 21, line 15 * * page 22, line 29 - page 23, line 14 * * page 27, line 14 - page 28, line 6; figures 2,3,4A *	1,5	H04L12/28 H04L12/56
A	WO 95 33358 A (DU PONT) 7 December 1995 (1995-12-07) * page 11, line 7 - page 12, line 16 * * page 22, line 10 - page 24, line 10 *	1,5	
A	US 5 488 412 A (MIDANI MOWAFFAK T ET AL) 30 January 1996 (1996-01-30) * column 5, line 15 - column 7, line 55 *	1,5	
A	US 5 347 304 A (LONG JAMES C ET AL) 13 September 1994 (1994-09-13) * column 3, line 43 - column 4, line 8 *	1,5	TECHNICAL FIELDS SEARCHED (Int.Cl.6)  H04L H04N
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>24 January 2000</b>	Examiner <b>Gerling, J.C.J.</b>
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant; if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03 82 (P4/C01)

UNITED STATES PATENT AND TRADEMARK OFFICE  
DEPARTMENT OF COMMERCE

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INVENTOR: JAMES M. SMITH  
BY: JAMES M. SMITH  
ATTORNEY: JAMES M. SMITH

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 97 30 6345

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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24-01-2000

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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## Description

### Field of the Invention

This invention relates to a data reception system including apparatus and methods for communicating data through a wireless TV connection device (i.e., a Settop Box) and in particular to using a Settop Box receiver for receiving packet signals from a satellite transmission and accompanying means for data transmission to a wireless network, via a CDPD (Cellular Digital Packet Data) cellular network.

### Background of the Invention

Settop Boxes are designed in general to receive TV signals via broadband media such as satellite transmissions and cable connections. Because of the broad bandwidth of TV signals, Settop Boxes such as a DirecTV™ Settop Box have the capability for receiving data at high transmission rates. This capability is largely unused in other applications because of the singular application, concerning TV reception, accorded Settop Boxes. These applications use TV specific data compression techniques directed specifically to TV transmission and hence data transmission per se is not normally thought of as an application for the Settop Box.

### Summary of the Invention

Termination equipment for a WorldNet™ wireless network receives ATM (Asynchronous Transfer Mode) packet data from a data terminal of a DirecTV™ Settop Box. This data is directed to a recipient through a first input port of a directionally sensitive router (i.e., a packet direction is controlled within the router to be from an input port to an output port irrespective of header address) and transmitted by a subsequent wireless or coax LAN to customer premises data equipment. Replies to the network by customer premises equipment are transmitted by wireless or coax LAN to the directionally sensitive router and then from the router to a CDPD radio modem for transmission, via CDPD cellular, to a remote wireless termination connected to the wireless network.

### Brief Description of the Drawing

The sole figure is a block diagram of a data processing/transceiver schema to receive data through a DirecTV™ Settop Box, couple it to a wireless LAN, and transmit outgoing data from the LAN as a CDPD transmission.

### Detailed Description

A system for WorldNet™ wireless network access, as shown in the the figure, includes a dish antenna 101

for reception of broadband data and TV signals from a satellite transmitter or a microwave transmitter for example. It is connected by a coax cable (RG-6) 102 to a DirecTV™ Settop Box 103 which is primarily designed to receive compressed TV signals and decompress them and apply them, via a coax (RG-6) cable 105, to a TV set 106. (TV sets and settop boxes are consumer appliances which are readily available and need not be described herein). Settop Box 103 has a wideband capacity for handling television signals and in many cases the device has a non-TV data output port. It is primarily a receiving device and normally does not transmit signals. Signals are received primarily from satellite dish antenna 101. The received signals are normally compressed TV signals which are subsequently decompressed for viewing. Data signals are extracted before any decompression processing. The Settop Box herein includes a data port 107 which is connected by a multi-conductor cable 109 to an input port 110 of a WorldNet™ Data Port 111.

The WorldNet™ data port 111 includes a a DirecTV™ Settop Box interface 121 connected to the multi-conductor cable 109, via its input port 110. Such interface may be designed in accord with operational descriptions provided upon request by the Hughes Corp.

The output of the interface 121 is connected to a directionally sensitive Data Processor/Router 125. Router 125 reads packet header address information and uses this information to determine an ultimate address for the packet. The receiving port identity of the router determines the proper router output of the packet. Its ultimate address, after exiting the router, is determined by the the packet header which directs the packet to its intended destination after leaving the router.

Router 125 is direction sensitive having controlling algorithms for directing packets from a particular input to go to a particular output of the router. Ultimate packet destinations are of course controlled by a packet header address.

Packets received by the router from interface 121 are directed to the broadband Packet Radio LAN PC-MCIA 135. Packets returned from LAN PC-MCIA 135 are directed by the router 125 to a CDPD modem 141. While this operates differently from the traditional router, in which packet directionality is based solely on a header address, its design will be readily apparent to those skilled in the art.

An EtherNet™ processor station 126, also connected to router 125, connects to a cable TV modem 127 receiving TV signals or data information, via coax (RG-6) cable 129. In appropriate circumstances the EtherNet™ processor station may be a LAN station permitting the transmission of data into the LAN. Such a processor is provided commercially by Motorola identified commercially as MC 68360. As shown output cable 123 may be connected to a wired PC. The router 125



may also directly couple the EtherNet™ station to radio modem 141 for sourcing CDPD transmissions.

Router 125, of data port 111, is connected, via PC-MCIA (Personal Computer Memory Card Industry Association) connector devices 131, to a broadband Packet Radio LAN PC-MCIA 135. PC-MCIA is a commercially available plug-in card that includes a radio transceiver and a 1/4 wave vertical antenna 136 for RF transmission and reception. Hence packets may be sent by radio and received as an RF radio signal. Router 125 is capable of handling received packets and at a certain input and forwarding them to an input dependent output due to the routers input controlled directional sensitivity. Wireless packets from the LAN, received via the antenna 136 and the packet radio 135 are coupled to a PC-MCIA radio modem 141, as discussed below. This packet radio unit 135 communicates through an antenna 136 for providing radio transmission and reception of packets to and from a wireless LAN. Unit 135 also includes a cable connection 137 for wired access to cable connected LANs.

The data port 111 is also connected, through the router 125 to the radio modem 141 which is a PC-MCIA card containing a CDPD radio modem for communicating, via a 1/4 wave vertical antenna 142 with a CDPD (Cellular Digital Packet Data) wireless packet network. CDPD is a commercially available service and is well known to those skilled in the art. Its primary value is as a back-channel for internet surfing where the downlink is via DirecTV™ service. This unit also provides the capability for the LAN to communicate outside the LAN with other data systems through the router 125 and CDPD modem 141 to a CDPD wireless network. It receives its data packets for transmission directly from the router 125, via lead 147, and transmits them by radio transmission (i.e., cellular transmission) to a cellular CDPD wireless system via its output antenna 142.

A status panel 151 is connected to and permits monitoring of the operational status of the Router 125. A power supply 155 is used to power the interfaces and the router. It may function through AC-to-DC conversion from a power outlet or in certain instances be comprised of a battery pack.

An optional Printed Wiring Board (PWB) 161 may be included in the data processing system and is used to control communications between a user and the TV and Settop Box. An example is the use of an air mouse 149, which communicates with the PWB by an infrared signal. This may be used for cursor control on the TV screen. This PWB is technically embodied similar to a browser circuit for web TV services and is well understood by those skilled in the art. Such a PWB includes an IO PC on a card 162, a memory 163 and a NTSC (i.e., National Television Standards Committee) interface 164 which is interconnected to the TV 106 and the DirecTV™ Settop Box. This allows for various data/audio transfers between the Settop Box 107 and TV 106 and/or stereo equipment.

The schematic 175 illustrates a possible physical size relation of the data port and the Settop Box.

## Claims

1. A customer premises termination system for receiving data, via wireless communications, from a remote data network through a customer premises data terminal of a Settop Box and communicating data to a CDPD network;

### CHARACTERIZED BY:

a data receiving interface device coupled to the data terminal of the Settop Box;

a data processor/router connected to the interface device and directionally processing incoming data packets to go to a router specified output of the data processor/router;

a wireless broadband duplex packet LAN, including an antenna, for two way wireless coupling of the data processor/router with a customer premises LAN/data processor; and

a CDPD radio modem connected to the data processor/router for receiving packets from the router and transmitting wireless CDPD packets generated by the customer premises LAN/data processor.

2. A customer premises termination system for receiving data, as claimed in claim 1, including

an EtherNet™ station/interface unit coupled to a cable modem and to the data processor router for transmitting data signals from the cable modem to the data processor router and from the router to the modem wherein the EtherNet™ station/interface is an active LAN station.

3. A customer premises termination system for receiving data, as claimed in claim 1, including

a status indicator panel connected to the data processor router.

4. A customer premises termination system as claimed in claim 1, comprising:

a control card connected to the Settop Box and a TV set and having an IR interface for receiving IR control signals from a user.

5. A method of receiving and transmitting data from a wireless network through a data terminal of a Settop Box and communicating data to a CDPD network through a wireless transmit terminal and to a wireless LAN via a router;

### CHARACTERIZED BY the steps of:

receiving a wideband data signal in packet format through a Settop Box;

coupling the received wideband data packet signal to a directionally sensitive router and directing the data packet to a LAN according to router directionality control;

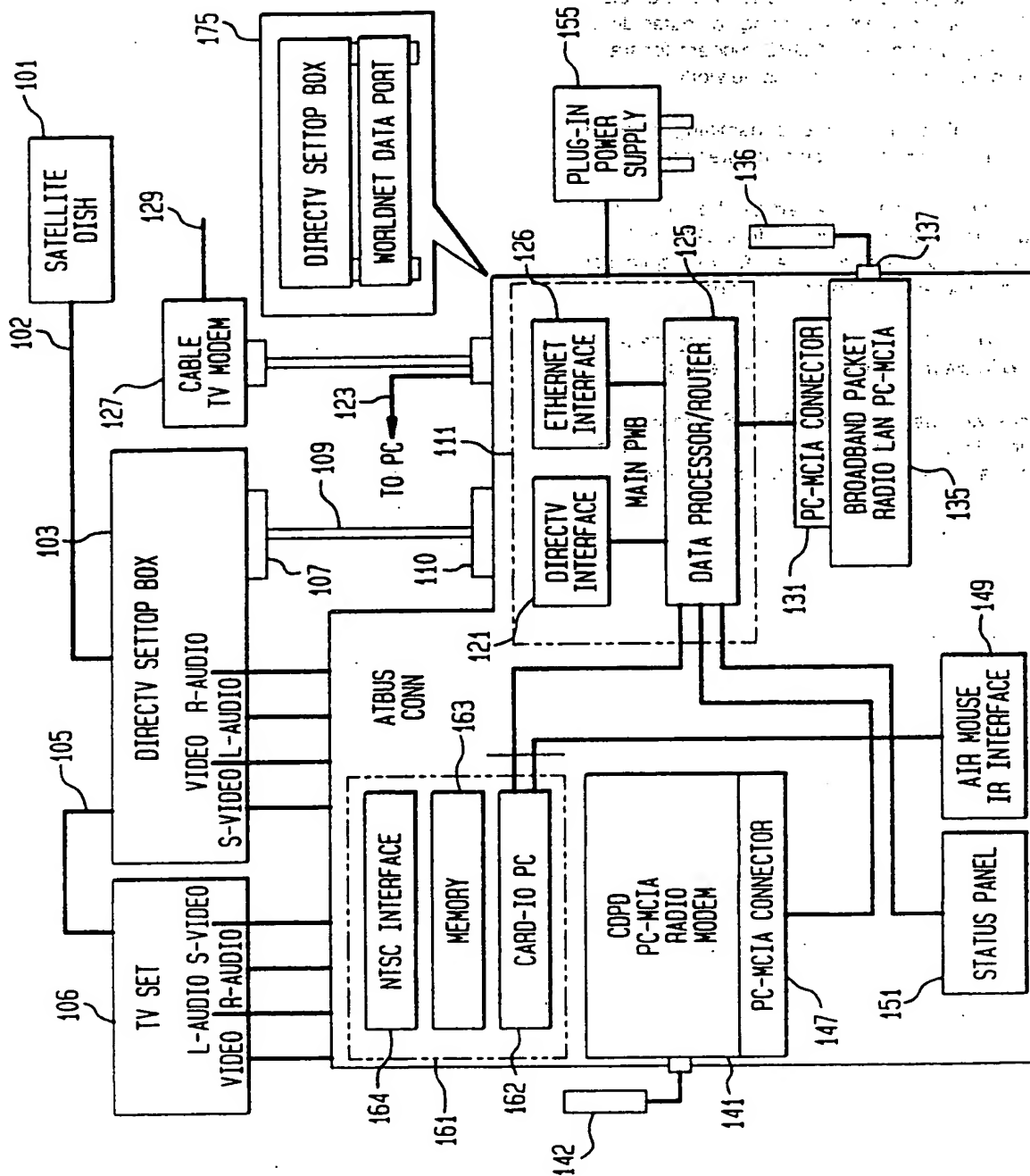
receiving packets from the LAN at the router and coupling them according to router directionality control to a CDPD modem for transmission to a CDPD wireless network.

6. A method of receiving and transmitting data, as claimed in claim 5, comprising the steps of:

directing packets received by the router to a radio for radio transmission to a LAN; and receiving packets from the LAN for application to the router by radio transmission.

7. A method of receiving and transmitting data, as claimed in claim 6, comprising the steps of:

receiving data by DirectTV™ Settop Box and directly coupling the data to a CDPD modem for transmission to a CDPD cellular network.



1. *Journal of the American Medical Association*, 1997; 277: 1033-1036.

[illegible]

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1. *Chlorophyll a* and *Chlorophyll b* were determined by the method of Lichtenthal and Whistler (1973).

1. *Chlorophyll a* (Chl *a*)

$\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

the 1990s, the number of people in the United States who are 65 years of age or older has increased by 50 percent, and the number of people 75 years of age or older has increased by 100 percent. The number of people 85 years of age or older has increased by 200 percent. The number of people 95 years of age or older has increased by 400 percent. The number of people 100 years of age or older has increased by 1,000 percent. The number of people 105 years of age or older has increased by 2,000 percent. The number of people 110 years of age or older has increased by 4,000 percent. The number of people 115 years of age or older has increased by 8,000 percent. The number of people 120 years of age or older has increased by 16,000 percent. The number of people 125 years of age or older has increased by 32,000 percent. The number of people 130 years of age or older has increased by 64,000 percent. The number of people 135 years of age or older has increased by 128,000 percent. The number of people 140 years of age or older has increased by 256,000 percent. The number of people 145 years of age or older has increased by 512,000 percent. The number of people 150 years of age or older has increased by 1,024,000 percent. The number of people 155 years of age or older has increased by 2,048,000 percent. The number of people 160 years of age or older has increased by 4,096,000 percent. The number of people 165 years of age or older has increased by 8,192,000 percent. The number of people 170 years of age or older has increased by 16,384,000 percent. The number of people 175 years of age or older has increased by 32,768,000 percent. The number of people 180 years of age or older has increased by 65,536,000 percent. The number of people 185 years of age or older has increased by 131,072,000 percent. The number of people 190 years of age or older has increased by 262,144,000 percent. The number of people 195 years of age or older has increased by 524,288,000 percent. The number of people 200 years of age or older has increased by 1,048,576,000 percent. The number of people 205 years of age or older has increased by 2,097,152,000 percent. The number of people 210 years of age or older has increased by 4,194,304,000 percent. The number of people 215 years of age or older has increased by 8,388,608,000 percent. The number of people 220 years of age or older has increased by 16,777,216,000 percent. The number of people 225 years of age or older has increased by 33,554,432,000 percent. The number of people 230 years of age or older has increased by 67,108,864,000 percent. The number of people 235 years of age or older has increased by 134,217,728,000 percent. The number of people 240 years of age or older has increased by 268,435,456,000 percent. The number of people 245 years of age or older has increased by 536,870,912,000 percent. The number of people 250 years of age or older has increased by 1,073,741,824,000 percent. The number of people 255 years of age or older has increased by 2,147,483,648,000 percent. The number of people 260 years of age or older has increased by 4,294,967,296,000 percent. The number of people 265 years of age or older has increased by 8,589,934,592,000 percent. The number of people 270 years of age or older has increased by 17,179,869,184,000 percent. The number of people 275 years of age or older has increased by 34,359,738,368,000 percent. The number of people 280 years of age or older has increased by 68,719,476,736,000 percent. The number of people 285 years of age or older has increased by 137,438,953,472,000 percent. The number of people 290 years of age or older has increased by 274,877,906,944,000 percent. The number of people 295 years of age or older has increased by 549,755,813,888,000 percent. The number of people 300 years of age or older has increased by 1,099,511,627,776,000 percent. The number of people 305 years of age or older has increased by 2,199,023,255,552,000 percent. The number of people 310 years of age or older has increased by 4,398,046,511,104,000 percent. The number of people 315 years of age or older has increased by 8,796,093,022,208,000 percent. The number of people 320 years of age or older has increased by 17,592,186,044,416,000 percent. The number of people 325 years of age or older has increased by 35,184,372,088,832,000 percent. The number of people 330 years of age or older has increased by 70,368,744,177,664,000 percent. The number of people 335 years of age or older has increased by 140,737,488,355,328,000 percent. The number of people 340 years of age or older has increased by 281,474,976,710,656,000 percent. The number of people 345 years of age or older has increased by 562,949,953,421,312,000 percent. The number of people 350 years of age or older has increased by 1,125,899,906,842,624,000 percent. The number of people 355 years of age or older has increased by 2,251,799,813,685,248,000 percent. The number of people 360 years of age or older has increased by 4,503,599,627,370,496,000 percent. The number of people 365 years of age or older has increased by 9,007,199,254,740,992,000 percent. The number of people 370 years of age or older has increased by 18,014,398,509,481,984,000 percent. The number of people 375 years of age or older has increased by 36,028,797,018,963,968,000 percent. The number of people 380 years of age or older has increased by 72,057,594,037,927,936,000 percent. The number of people 385 years of age or older has increased by 144,115,188,075,855,872,000 percent. The number of people 390 years of age or older has increased by 288,230,376,151,711,744,000 percent. The number of people 395 years of age or older has increased by 576,460,752,303,423,488,000 percent. The number of people 400 years of age or older has increased by 1,152,921,504,606,846,976,000 percent. The number of people 405 years of age or older has increased by 2,305,843,009,213,693,952,000 percent. The number of people 410 years of age or older has increased by 4,611,686,018,427,387,904,000 percent. The number of people 415 years of age or older has increased by 9,223,372,036,854,775,808,000 percent. The number of people 420 years of age or older has increased by 18,446,744,073,709,551,616,000 percent. The number of people 425 years of age or older has increased by 36,893,488,147,419,103,232,000 percent. The number of people 430 years of age or older has increased by 73,786,976,294,838,206,464,000 percent. The number of people 435 years of age or older has increased by 147,573,952,589,676,412,928,000 percent. The number of people 440 years of age or older has increased by 295,147,905,179,352,825,856,000 percent. The number of people 445 years of age or older has increased by 590,295,810,358,705,651,712,000 percent. The number of people 450 years of age or older has increased by 1,180,591,620,717,411,303,424,000 percent. The number of people 455 years of age or older has increased by 2,361,183,241,434,822,606,848,000 percent. The number of people 460 years of age or older has increased by 4,722,366,482,869,645,213,696,000 percent. The number of people 465 years of age or older has increased by 9,444,732,965,739,290,427,392,000 percent. The number of people 470 years of age or older has increased by 18,889,465,931,478,580,854,784,000 percent. The number of people 475 years of age or older has increased by 37,778,931,862,957,161,709,568,000 percent. The number of people 480 years of age or older has increased by 75,557,863,725,914,323,419,136,000 percent. The number of people 485 years of age or older has increased by 151,115,727,451,828,646,838,272,000 percent. The number of people 490 years of age or older has increased by 302,231,454,903,657,293,676,544,000 percent. The number of people 495 years of age or older has increased by 604,462,909,807,314,587,353,088,000 percent. The number of people 500 years of age or older has increased by 1,208,925,819,614,629,174,706,176,000 percent. The number of people 505 years of age or older has increased by 2,417,851,639,229,258,349,412,352,000 percent. The number of people 510 years of age or older has increased by 4,835,703,278,458,516,698,824,704,000 percent. The number of people 515 years of age or older has increased by 9,671,406,556,917,033,397,649,408,000 percent. The number of people 520 years of age or older has increased by 19,342,813,113,834,066,795,298,816,000 percent. The number of people 525 years of age or older has increased by 38,685,626,227,668,133,590,597,632,000 percent. The number of people 530 years of age or older has increased by 77,371,252,455,336,267,181,195,264,000 percent. The number of people 535 years of age or older has increased by 154,742,504,910,672,534,362,390,528,000 percent. The number of people 540 years of age or older has increased by 309,485,009,821,345,068,724,781,056,000 percent. The number of people 545 years of age or older has increased by 618,970,019,642,690,137,449,562,112,000 percent. The number of people 550 years of age or older has increased by 1,237,940,039,285,380,274,899,124,224,000 percent. The number of people 555 years of age or older has increased by 2,475,880,078,570,760,549,798,248,448,000 percent. The number of people 560 years of age or older has increased by 4,951,760,157,141,521,099,596,496,896,000 percent. The number of people 565 years of age or older has increased by 9,903,520,314,283,042,199,193,993,792,000 percent. The number of people 570 years of age or older has increased by 19,807,040,628,566,084,398,387,987,584,000 percent. The number of people 575 years of age or older has

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the 1990s, the number of people in the world who are under 15 years of age is expected to increase by 1.5 billion, from 1.1 billion in 1990 to 2.6 billion in 2010. The number of people aged 65 and over is expected to increase by 1.1 billion, from 0.4 billion in 1990 to 1.5 billion in 2010. The number of people aged 15-64 is expected to increase by 1.5 billion, from 1.1 billion in 1990 to 2.6 billion in 2010. The number of people aged 65 and over is expected to increase by 1.1 billion, from 0.4 billion in 1990 to 1.5 billion in 2010. The number of people aged 15-64 is expected to increase by 1.5 billion, from 1.1 billion in 1990 to 2.6 billion in 2010.

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1. 6. 1991

1. *Chlorophyll a* and *Chlorophyll b* were determined by the method of Arar and Collins (1971).